Amendments to the Specification:

Please replace the paragraph beginning at page 1, line 7, with the following rewritten paragraph:

--This application is a continuation of U.S. Application Serial No. 09/906,290, filed July 16, 2001, now issued U.S. Patent No. 6,704,661.--

Please replace the paragraph beginning at page 6, line 13, with the following rewritten paragraph:

--Brief Description of the Drawings

Figure 1 is schematic diagram of a periodic surface feature of the prior art.

Figure 2 is a block diagram of a system for performing the methods of the subject invention.

Figure 3 is a simplified schematic of the processor used for performing the methods of the subject invention.

Figure 4 is a flow chart illustrating the subject approach for analyzing optical data to evaluate characteristics of a periodic structure.

Figure 5 [[is]] illustrates the shape of the model in a first step of the subject method.

Figure 6 [[is]] illustrates the shape of the model in a subsequent step of the subject method.

Figure 7 [[is]] illustrates the shape of the model in a subsequent step of the subject method.--

Please replace the paragraph beginning at page 8, line 14, with the following rewritten paragraph:

--In the preferred embodiment, and as shown in Figure 3, the architecture of the processor 30 consists of a plurality of microprocessor units linked by an Ethernet connection. The operating software is arranged to set one of the processors as a master 32 and the remainder of the processors as slaves 34. The master handles the higher level functions and distributes the tasks and retrieves the results from the slaves. Such a system is available commercially from Linux ~~Networkx~~ Networx, Inc., headquartered in Bluffdale, Utah, under the trade name ~~Evolcity~~ Evolocity™, a registered trademark of Linux Networx, Inc. In the system used to evaluate the

subject invention, an eight processor configuration was selected with each processor operating at 1.3 gigahertz. When properly combined, the system will operate at a speed equivalent to about 10 gigahertz. The approach for distributing the processing tasks will be discussed below.--

Please replace the abstract, beginning at page 24, line 5, with the following rewritten paragraph:

--A system for characterizing periodic structures ~~formed on a sample~~ on a real time basis is disclosed. A multi-parameter ~~spectroscopic~~ measurement module generates output signals as a function of wavelength or angle of incidence. The output signals are supplied to a parallel processor ~~for evaluation.~~, which ~~The processor~~ creates an initial theoretical model ~~having a rectangular structure. The processor than~~ and calculates the theoretical optical response ~~of that sample to broad band radiation~~. The calculated optical response is compared to ~~normalized~~ measured values ~~at each of a plurality of wavelengths~~. Based on the comparison, the model configuration is modified to be closer to the actual measured structure. ~~The processor recalculates the optical response of the modified model and compares the result to the normalized data. This process is repeated in an iterative manner until a best fit rectangular shape is achieved.~~ Thereafter, the complexity of the model is iteratively increased, by dividing the model into layers each having an associated width and height. The model is fit to the data in an iterative manner until a best fit model is obtained which is similar in structure to the periodic structure. ~~In the preferred embodiment, the processor consists of a plurality of parallel co-processors. The steps of calculating the optical response of the model is distributed to the processors as a function of wavelength so these calculations can be performed in parallel. An alternate embodiment using multiple angle of incidence measurements is also disclosed.~~ --